

# Mediating cognitive effects of information sharing on the relationship between budgetary participation and managerial performance<sup>\*,\*\*</sup>

**Micheli Aparecida Lunardi<sup>1</sup>**

 <https://orcid.org/0000-0003-0622-928X>


Email: michelilunardi01@gmail.com

**Vinícius Costa da Silva Zonatto<sup>2</sup>**

 <https://orcid.org/0000-0003-0823-6774>

Email: viniciuszonatto@gmail.com

**Juliana Constâncio Nascimento<sup>3</sup>**

 <https://orcid.org/0000-0002-8661-127X>

Email: jcbriada@hotmail.com

<sup>1</sup> Universidade do Estado de Santa Catarina, Centro de Educação Superior do Alto Vale do Itajaí, Departamento de Ciências Contábeis, Ibirama, SC, Brazil

<sup>2</sup> Universidade Federal de Santa Maria, Departamento de Ciências Contábeis, Santa Maria, RS, Brazil

<sup>3</sup> Faculdade de Balsas, Departamento de Ciências Contábeis, Balsas, MA, Brazil

Received on 07.31.2018 – Desk acceptance on 09.17.2018 – 5<sup>th</sup> version approved on 06.30.2019 – Ahead of print on 10.14.2019

Associate Editor: Cláudio de Araújo Wanderley

## ABSTRACT

This article aims to analyze the mediating cognitive effects of vertical information sharing in the budgeting process on the relationship between budgetary participation and managerial performance. The behavioral literature in the area of accounting has diverged regarding the cognitive effects of budgetary participation on managerial performance. Evidence found in this literature reveals that there are possible intervening variables in this relationship that may influence the cognitive effects of participation on performance. Considering that budgetary participation can affect the cognition and performance of individuals at work, it is relevant to analyze the budget management practices adopted by organizations and the effects they have on individuals with budgetary responsibilities. The evidence found shows that an organization's budgetary configuration influences the way information sharing will occur and will consequently have cognitive effects on managerial performance. This descriptive study was conducted by collecting data and employing a quantitative approach to analyze them, using structural equations modeling. The research sample comprised 316 respondents with budgetary responsibilities who carry out the role of controller, controlling manager, or controlling coordinator in Brazilian companies. The results show that budgetary participation positively influences vertical information sharing, which presented a positive influence on managerial performance. Vertical information sharing results from cognitive effects of budgetary participation. Higher levels of vertical information sharing are reflected in lower role ambiguity and better managerial performance. Even if individuals with budgetary responsibilities perceive the existence of information asymmetry in the work environment, its effects on performance are not significant. These results contribute to understanding the mediating cognitive effects of information sharing on the relationship between participation and performance, revealing that the effects of participation on performance may not occur based on a simple causality relationship, but instead based on certain conditioning factors.

**Keywords:** budgetary participation, vertical information sharing, managerial performance.

## Correspondence address

**Micheli Aparecida Lunardi**

Universidade do Estado de Santa Catarina, Centro de Educação Superior do Alto Vale do Itajaí, Departamento de Ciências Contábeis  
Rua Doutor Getúlio Vargas, 2822 – CEP 89140-000  
Bela Vista – Ibirama – SC – Brazil

\* Paper presented at the XII ANPCONT Congress, João Pessoa, PB, Brazil, June 2018.

\*\* The authors are grateful to the National Council for Scientific and Technological Development (CNPq) and to the Coordination for the Improvement of Higher Education Personnel (Capes) for their financial support to carry out this research.



## 1. INTRODUCTION

The management control procedures often used in organizations involve the participation of managers and their subordinates (Baiman & Evans, 1983; 2002; Silva & Gomes, 2011). Standing out among these is budgetary participation (Silva & Gomes, 2011). Chen (2003) and Kyj and Parker (2008) explain that budgetary participation uses the budget as a communication channel between managers and their subordinates.

This process encourages dialogue and communication between superiors and subordinates, creating a common cognitive base and facilitating knowledge transfer (Chong, Eggleton & Leong, 2005; Parker & Kyj, 2006). Despite budgetary participation enabling the information of subordinates to be incorporated into the performance evaluation system, one difficulty in this process is when the subordinate cannot communicate all the information to the superior or is not willing to communicate it honestly (Covaleski, Evans, Luft & Shields, 2006; Mia & Patiar, 2002), thus creating information asymmetry.

Individuals are constantly exposed to a variety of expectations from themselves when carrying out their activities, and these expectations have influenced how subordinates understand their organizational functions (Marginson & Ogden, 2005). Unclear or vague expectations can cause role ambiguity (Kim, Murrmann & Lee, 2009).

Role ambiguity is influenced by organizational characteristics, such as the type of organizational structure and the personal characteristics of each individual (Marginson & Ogden, 2005; Zonatto, Weber & Nascimento, 2019). In companies that present role ambiguity, budgetary participation can offer comfort and assurance to subordinates (Chenhall & Brownell, 1988; Marginson & Ogden, 2005), which can attenuate possible negative effects of this variable over individuals' managerial performance in their work activities. For Mia and Patiar (2002), managerial performance is related to carrying out successful management functions.

However, the participation of subordinates in budgetary processes does not ensure that the levels of information asymmetry and role ambiguity that exist in a company will be reduced and the desired managerial performance achieved (Zonatto et al., 2019). It is understood that this will only be accomplished when there is vertical information sharing (Parker & Kyj, 2006). Thus, it follows that it is the information sharing in the budgeting process that determines the cognitive effects of participation on performance, and not only the level of participation (Nouri & Parker, 1998; Parker & Kyj, 2006).

Regarding this, the behavioral literature in the area of accounting has overlooked information sharing when analyzing the effects of budgetary participation on managerial performance (Kyj & Parker, 2008; Zonatto, 2014). The evidence found in the literature on the intervening effects on this relationship is underexplored, thus presenting a theoretical gap that encourages this study (Dani, Zonatto & Diehl, 2017). Similarly, little is known about these relationships in a specific sample of managers responsible for the controlling area, an important organizational unit that supports management (Palomino & Frezatti, 2016). Controlling carries out the function of transforming information so that it assists and facilitates decision-making in other areas of the organization (Siegel & Kulesza, 1996), playing an important role in the preparation of strategic and budgetary plans (Govindarajan & Anthony, 2001).

The evidence found for the relationship between budgetary participation and managerial performance has presented various results that indicate a direct (Kyj & Parker, 2008; Parker & Kyj, 2006; Zonatto et al., 2019) or indirect relationship between these variables, measured by other intervening variables (Baldvinsdottir, Mitchell & Norreklit, 2010; Dani et al., 2017; Derfuss, 2016), such as motivation (Chong et al., 2005; Karakoc & Ozer, 2016; Mia, 1988), satisfaction (Kyj & Parker, 2008), and organizational commitment (Chong & Johnson, 2007; Parker & Kyj, 2006). These results reinforce the indications that the effects of participation on performance may not occur based on a simple causality relationship, but instead based on certain conditioning factors.

It should also be considered that the results found in previous studies have diverged in relation to the effects of the relationship between budgetary participation and managerial performance (Dani et al. 2017; Derfuss, 2016). There is evidence that reveals a positive relationship between budgetary participation and performance, such as in Lau and Lim (2002), Chong et al. (2005), Lau and Tan (2005), Agbejule and Saarikoski (2006), Chong and Johnson (2007), Zonatto and Lavarda (2013), and Zonatto et al. (2019). However, there are studies that have indicated a negative (Mia, 1988; Brownell, 1981) or even non-significant relationship between these variables (Dunk, 1989; Milani, 1975).

In light of the above, the problem question that stimulates this study is: what are the mediating cognitive effects of vertical information sharing in the budgeting process on the relationship between budgetary

participation and managerial performance? Thus, the general objective established for the study is to answer this question.

The academic production related to budgetary participation may still be considered underdeveloped in Brazil (Dani et al., 2017; Lavarda & Almeida, 2013) and inconclusive (Dani et al., 2017), thus requiring new studies that preferentially focus on investigating the effect of intervening variables on this relationship (Derfuss, 2016), in order to better understand under what conditions participation results in better performance. Thus, this study presents important implications for the knowledge on the topic, since it provides evidence of the conditioning effects of the levels of information sharing on these relationships (participation and performance) and how this sharing is consequently reflected in information asymmetry, in role ambiguity, and in managerial performance.

This study makes a contribution for researchers interested in issues related to internal controls, budgeting, and behavioral accounting, given that the results may provide new evidence of the cognitive effects of the participation of individuals in budgeting processes. In addition, by demonstrating this to professionals who determine organizational structures and who establish the design of management control systems in companies, this study contributes to understanding their implications for the job performance of individuals.

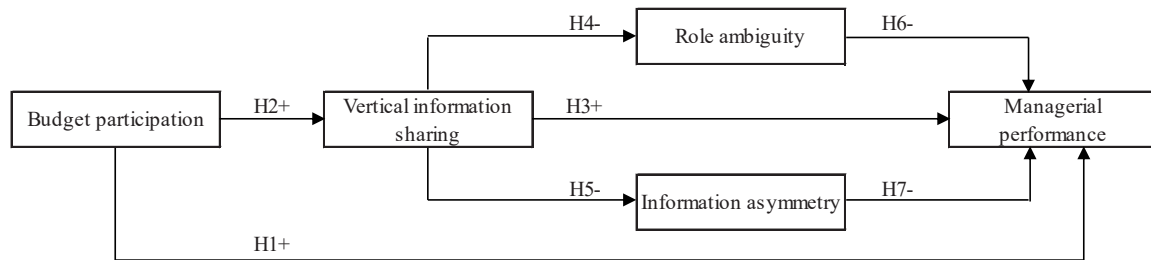
The results of this study support the evidence that budgetary participation directly and indirectly influences managerial performance. These conditions have favored information sharing, reducing role ambiguity and information asymmetry and improving managerial performance. They also provide indications of the cognitive effects of the vertical information sharing resulting from the informative roles of the budget. Thus, they support the evidence of the direct and indirect effects of the budget over the actions of individuals in this context, as well as indicating how its use can result in better budget forecasts, more involvement of these professionals in the work, and the obtainment of better performance at the managerial level.

In addition, as practical and social contributions of this study, by using organizations that operate in Brazil to reveal budget management practices and their effects on the cognitions of individuals with budgetary responsibilities in the work environment, it enables them to evaluate their current management practices, in order to establish skill-building and training courses that lead to these professionals achieving better managerial performance. The findings of this study also serve as a parameter for other organizations that have not been studied so that they can evaluate the adoption of budget management practices that contribute to minimizing the negative effects of information asymmetry and role ambiguity, with a view to obtaining better performance.

## 2. THEORETICAL ANALYSIS MODEL AND RESEARCH HYPOTHESES

Given the research opportunity identified, this study seeks to understand the interactions present in the budgeting process from a wider theoretical perspective, emphasizing the intervening effects of information sharing. Thus, when analyzed in isolation, the existence of a possible direct and indirect association is recognized between budgetary participation and managerial performance. However, in the theoretical model elaborated, these effects are tested simultaneously with the other relationships that are the object of analysis, in order to be able to understand the drivers of performance.

It is therefore possible to infer whether budgetary participation has a direct and indirect effective influence on performance or whether this influence is determined by the conditions in which information sharing occurs. Consequently, the evidence produced based on these findings present important implications for the field of studies, since it may reveal the possible explanation for the inconsistent results found in some previous studies developed on the topic. Figure 1 presents the theoretical analysis model and the general overview of the hypotheses established for the investigation.



**Figure 1** Theoretical analysis model and general overview of the research hypotheses

Source: Elaborated by the authors.

The direct effects of budgetary participation over the performance of subordinates have been the object of considerable investigations in the area of management accounting (Chong et al., 2005). The relationship between budgetary participation and managerial performance presents a much-debated question in the research developed from the behavioral perspective of accounting, but it is as yet unresolved. This occurs because its effects may not be perceived directly, but rather indirectly, through intervening variables (Dani et al., 2017; Derfuss, 2016).

Ferris (1977) and Zonatto (2014) define managerial performance as the degree to which individuals obtain success when carrying out their work activities. For Mia and Patiar (2002), the concept of managerial performance consists of individuals successfully carrying out all their functions and attributions developed by during the management process.

Studies have demonstrated that budgetary participation presents a positive effect on managerial performance through motivational and cognitive mechanisms (Covaleski et al., 2006; Kren, 1992; Parker & Kyj, 2006; Shields & Shields, 1998; Zonatto, 2014; Zonatto et al., 2019). In addition, studies have shown that budgetary participation leads to better job performance, as subordinates understand that they are being treated as valuable partners in the decision-making process (Jermias & Yigit, 2012; Zonatto et al., 2019).

Thus, in the first hypothesis tested in this investigation, it is assumed that a subordinate's participation in the budgeting process increases the level of managerial performance, which indicates a positive relationship between these variables:

H1: budgetary participation is positively associated with managerial performance.

However, considering the evidence presented in revisional studies developed by Derfuss (2016) and Dani et al. (2017), it is understood that when these relationships are investigated by observing, in the theoretical analysis

model, the effect of other intervening variables present in the budgeting process, as in the case proposed in this investigation (Figure 1), it is acknowledged that such direct effects may not be identified. From this perspective, the alternative hypothesis presented to explain these results relates to the intervening cognitive effects of information sharing, which would be conditioning factors in achieving better performance.

Zoni and Kenneth (2007) highlight that greater levels of controller participation in both strategic and operational management processes are perceived when the participation is related with some organizational variables, such as capital intensity, interdependence between areas, financial manager competences, and formalization of strategic planning and of the budgeting process.

The reason for an organization to have budgetary participation is information sharing between superiors and subordinates (Kyj & Parker, 2008; Shields & Shields, 1998). For Parker & Kyj (2006), vertical information sharing involves subordinates revealing private information to their superiors.

Shields and Young (1993) revealed that budgetary participation is most important for planning, control, and the sharing of information between subordinates and superiors, and there are reasons for the existence of a participative budgeting model. In these conditions, the budgetary participation of subordinates is expected to be able to positively influence vertical information sharing in the companies analyzed in this study.

According to Dunk (1993), with budgetary participation, managers and subordinates communicate more with each other, sharing information and thus developing budgetary goals more precisely, since they have better quality information. Parker and Kyj (2006) explain that a successful model for vertical information sharing in the budgeting process can improve the organization's budgeting process.

In their study, the authors identified a positive relationship between budgetary participation and vertical information sharing with senior management. Thus, in



the second hypothesis tested in this study, it is understood that budgetary participation can positively influence vertical information sharing.

H<sub>2</sub>: budgetary participation is positively associated with vertical information sharing.

One of the most important benefits of the budgeting process is information sharing between members of the organization (Hopwood, 1976). Information exchange between subordinates and superiors during budgetary discussions is especially important, with many possible benefits both for the individual and for the organization (Shields & Shields, 1998). Information sharing can increase individual performance, enabling superiors to help develop better strategies for subordinates (Murray, 1990) and to ensure that they receive adequate budgetary support.

Nouri and Parker (1998) highlight that the disclosure of private information held by subordinates can enable superiors help to develop better strategies in relation to budgets. The evidence found by Parker and Kyj (2006) suggests that vertical information sharing is positively associated with managerial performance. Thus, in this study it is believed that vertical information sharing is able to positively and significantly influence the job performance of individuals.

H<sub>3</sub>: vertical information sharing is positively associated with managerial performance.

Chong et al. (2005) highlight that budgetary participation presents subordinates with the opportunity to share, clarify, and discuss information on the organization with their superiors. Thus, greater participation by the individual in the budgeting process reduces role ambiguity (Chenhall & Brownell, 1988; Jackson & Schuler, 1985; Zonatto et al., 2019). Parker and Kyj (2006) tested the effects of vertical information sharing, analyzing the quality of the communication carried out in organizations. Previous studies suggest links between budgetary participation, role ambiguity, and managerial performance. However, this relationship may be mediated by information sharing (Parker & Kyj, 2006).

Thus, to carry out this research, it is understood that individuals are likely to present less resistance to change, a reduction in anxiety, and better comprehension of the activities to be carried out in the organization when information sharing occurs. Therefore, the fourth hypothesis establishes that:

H<sub>4</sub>: vertical information sharing is negatively associated with role ambiguity.

Vertical information sharing can also facilitate employee loyalty and trust in the organization's management, promoting cooperation and flexibility at all management levels (Mia & Patiar, 2002), which may consequently contribute to reducing information asymmetry between superiors and subordinates. Clarkson, Jacobsen, and Batcheller (2007) suggested that information sharing is needed in an organization so that information asymmetry problems are resolved and greater awareness of the information is produced.

Despite some authors suggesting that budgetary participation can smooth out asymmetry levels in an organization, this does not always occur (Lavarda & Almeida, 2013), which suggests that there are other conditioning factors in the environment that are capable of interfering in this relationship. Information asymmetry is the result of information sharing (Clarkson et al., 2007). Thus, it is related to an individual's propensity to be willing to share information that he/she has, and this propensity is a determinant of the consequent effects of information sharing on the organizational environment, such as a reduction (or not) in asymmetry levels and the obtainment (or not) of better managerial performance.

Regarding this, Shields and Young (1993) and Lavarda and Almeida (2013) demonstrated that even in an environment with high manager participation in budgeting processes, they may experience a lack of information sharing regarding the activities carried out between management levels. In this context, to carry out this research, it follows that information sharing contributes to an improvement in communication between the different management levels (Baiman & Lewis, 1989). Therefore, it is assumed that information sharing is negatively related with information asymmetry.

H<sub>5</sub>: vertical information sharing is negatively associated with information asymmetry.

Chenhall and Brownell (1988) revealed that budgetary participation can provide information for reducing role ambiguity, and has contributed to improving the performance of subordinates (Chong et al., 2005; Kren, 1992). For Santos, Anzilago, and Lunkes (2017), the cognition of individuals can influence managerial performance.

It is believed that these events occur when there is a propensity for the individuals to share their information. Dunk (1993), Beuren, Roth, and Anzilago (2017), and Zonatto et al. (2019) identified a negative relationship between role ambiguity and the managerial performance of subordinates in the workplace. Therefore, it is believed that, in conditions of greater budgetary participation and

greater vertical information sharing, role ambiguity presents a negative relationship with managerial performance. The sixth research hypothesis was thus established.

H<sub>6</sub>: role ambiguity is negatively associated with managerial performance.

Information asymmetry and managerial performance have been the focus of debates in the area of management, as subordinates revealing private information to superiors results in more precise budgets, which consequently positively affects managerial performance (Magner, Welker & Campbell, 1996). From this perspective, a reduction in information asymmetry levels aims to improve the job performance of individuals (Clarkson et al. 2007; Zonatto & Lavarda, 2013).

However, there is evidence that information asymmetry may also be positively related with performance. The study developed by Mia and Patiar (2002) revealed a positive relationship between information asymmetry and managerial performance. When information asymmetry is present, budgetary slack can be created and subsequently used to achieve better managerial performance (Covaleski et al., 2006; Kren, 1992), which would explain such results.

Thus, to carry out this study, it is understood that, in conditions of greater vertical information sharing,

the relationship to be identified between information asymmetry and managerial performance tends to be negative, given that the informative roles of the budget favor communication, inhibit the creation of slack, and create conditions for the establishment of a more adequate budget plan, considering the budgetary needs of the organization and its different divisional unit managers. Therefore, the seventh research hypothesis establishes that:

H<sub>7</sub>: information asymmetry is negatively associated with managerial performance.

As can be verified based on the theoretical analysis model proposed for this investigation (Figure 1), it is understood that participation in itself is not enough to explain managerial performance, due to the existence of other variables in the budgeting process that interact and determine the conditions in which such influences occur. Thus, evidence is sought of a factor that conditions the obtainment of better managerial performance, observing the antecedent effects of the budgetary configuration adopted by the organization (participative or not), of the intervening variable vertical information sharing, and its consequent effects that are able to influence information asymmetry, role ambiguity, and performance.

### 3. METHODOLOGICAL PROCEDURES

The methodology adopted in this investigation is characterized as descriptive research, and it uses a survey for the data collection process and a quantitative approach for the data analysis. The study is characterized as descriptive, due to it presenting a description and analysis of cognitive effects of the participation of controllers, controlling managers, and controlling coordinators on budgeting processes. These effects are observed via vertical information sharing, role ambiguity, and information asymmetry. The study evaluates a model of vertical information sharing between superiors and subordinates in the budgeting process, where controllers, controlling managers, and controlling coordinators are the subordinates and their superiors are the executives responsible for the organizations.

The population of this research was defined based on an identification of the companies operating in the country that have managers with controller, controlling manager, and controlling coordinator functions. To define the sample to be investigated in the study, with the help of groups on LinkedIn, individuals in the country with

budgetary responsibilities who carry out these functions were contacted.

This population was chosen due to controllers assuming different positions in different companies, which makes them a strategic element in organizations, since they are the professionals with excellence in the information generated in organizations (Palomino & Frezatti, 2016). The management function is one of the competences or functions that belongs to the controlling area and is among controllers' responsibilities (Palomino & Frezatti, 2016). With regards to their participation in the budgeting process, Anthony and Govindarajan (2008) argue that controllers are responsible for functions that include preparing strategic and budgeting plans, installing and operationalizing budgeting programs and systems, as well as analyzing forecasted and executed budgets. However, controllers are also responsible for their budgeting units, which is a context investigated in this study, in which these professionals are answerable for the budget of their divisional units and not regarding the organizational budget.

After identifying the population that is the object of study, an invitation was initially sent via the LinkedIn business network to professionals registered there. This procedure was carried out in the period between November of 2016 and March of 2017. After an acceptance was received from the professional, the second data collection phase was begun, which consisted of sending the link to the questionnaire elaborated on Google Docs. A total of 1,985 invitations were sent and, of these, 852 agreed to answer the research instrument.

The sample analyzed is characterized as non-probabilistic, intentional, and obtained by accessibility,

and it involved the participation of 316 controllers from different organizations based in the country. Non-probabilistic samples are not necessarily chosen in order to be statistically representative of the population (Hair, Black, Babin, Anderson & Tatham, 2009). In an intentional sample, the researcher determines the elements and locations that he/she will investigate, since it is through these that he/she will understand the research problem (Creswell & Clark, 2007). The research instrument adopted to collect the data was developed with objective questions, contemplating the variables analyzed in the study. Table 1 presents the variables used and their operational definitions.

**Table 1**

*Constructs and operational definitions*

Variables	Operational definitions	Scale	Authors
Budgetary participation (BP)	Evaluates the individual's influence on the budgeting process.	Six indicators 7-point Likert	Milani (1975)
Vertical information sharing (IS)	Determines the degree to which subordinates communicate information about local conditions to their superiors.	Three indicators 7-point Likert	Parker and Kyj (2006)
Role ambiguity (RA)*	Describes the lack of clarity of expectations in relation to job roles and the level of uncertainty regarding the results of the performance itself.	Six indicators 7-point Likert	Rizzo, House, and Lirtzman (1970)
Information asymmetry (IA)*	Determines the degree to which a superior has more information than the subordinate regarding the subordinate's area of responsibility.	Six indicators 7-point Likert	Dunk (1993)
Managerial performance (MP)	Evaluates the performance measure of managers with budgeting responsibilities in their work activities.	Nine indicators 7-point Likert	Mahoney, Jerde, and Carroll (1963, 1965, cited by Zonatto, 2014)

\* = question with reverse scale.

**Source:** Elaborated by the authors.

First, the instruments to be used for the data collection were translated and checked by professors specialized in languages from the language department of the university the researchers work at. In this stage of the research, a comparison was also made between these translated instruments and those used in other studies already conducted in Brazil that used such instruments. Next, the adapted instrument was analyzed by a research professor from the managerial area of accounting, a doctor in accounting sciences and expert in this subject, to verify the translation and suggest adaptations that might be needed to capture the key concepts investigated in the study. After this evaluation, no new adjustments were made, and so we proceeded to carry out the pre-test.

In this study, the pre-test was carried out by applying the research instrument sent via email to PhD students with experience in the controlling area of the post-graduate program in accounting sciences of the university the researchers work at, thus constituting the pre-test participants. First, the purpose of the pre-test was

explained to the invited students and they were asked to participate and collaborate in evaluating each item of the proposed data collection instrument.

At the end of the pre-test, the suggestions for improvements in the collection instrument were identified to clarify some terms that might not be understood by the participants in the research. However, no questions were identified that the students did not understand. Having obtained the final version of the research instrument, the professionals were invited to answer the questionnaire, inferring its clarity, which was confirmed, and so we began the data collection stage.

Since the level of analysis in this investigation focuses on individuals, based on the definition of the minimum number of participants in the study, we adopted the use of structural equations modeling (SEM) to evaluate the theoretical relationships observed. Hair et al. (2009) state that in order to use structural equations five respondents are needed per indicator analyzed in the model. That minimum number of respondents was observed in this study.

After carrying out the data collection, these were tabulated in electronic spreadsheets imported for statistical treatment using the SPSS and AMOS software packages. First, a frequency analysis of the data collected in the study was carried out. This stage of the analysis involved descriptive statistics, identifying the theoretical interval (scale used) followed by the real interval (maximum and minimum), mean, and standard deviation. Next, we carried out the exploratory factor analysis of the constructs investigated. The criteria used for the exploratory factor analysis of the constructs were: Cronbach's alpha > 0.70, Kaiser-Meyer-Olkin (KMO) > 0.50, Bartlett's sphericity test  $p < 0.05$ , factor loads of the indicators > 0.35, and commonalities > 0.60, as recommended by Hair et al. (2009), considering the size of the sample.

After carrying out the exploratory analysis, we proceeded to the confirmatory factor analysis of the constructs investigated in the study. As Hair et al. (2009) explain, in a confirmatory data analysis test, the researcher should demonstrate the number of factors that exist in a set of variables and over what factor each variable will highly load before the results can be calculated. This type of analysis is suitable for using SEM. To carry out the confirmatory factor analysis and evaluation of the relationships investigated in the study via SEM, the AMOS® 19.0 software was used. The criteria adopted to make inferences about the validation of the measurements models and the relationships investigated are presented in Table 2.

**Table 2**

*Criteria used to evaluate the fit of the measurement constructs based on the Confirmatory Factor Analysis (CFA)*

Indicator	Recommended value	Reference	Expected value
Chi-squared/DF	< 5		< 5
Statistical significance (p)	< 0.05		< 0.05
CFI		Hair et al. (2009)	> 0.90
TLI			> 0.90
NFI			> 0.90
GFI			> 0.90
AGFI	< 0 and < 1 (the closer to 1 the better)	Jöreskog and Sörbom (1989)	> 0.90
RMSEA	< 0.10		< 0.10
Cronbach's alpha (construct)	> 0.70		> 0.70
Factor loads (indicators)	> 0.40	Hair et al. (2009)	> 0.40
Composite reliability	> 0.50		> 0.50
Extracted validity	> 0.50		> 0.50

*AGFI = adjusted goodness-of-fit index; CFI = comparative fit index; GFI = goodness-of-fit index; DF = degree of freedom; NFI = normed fit index; RMSEA = root mean square error of approximation; TLI = Tucker-Lewis index.*

**Source:** Adapted from Zonatto (2014).

Next, the control variables that may affect the relationships tested in the study were inserted, such as control (national/multinational), capital (open/closed), and, when industry, size (turnover), number of employees, and time the company has existed. Possible effects related to the characteristics of the company and of the individuals may significantly influence budgetary participation and, consequently, information sharing. It was noted whether the company operates in different

countries, as such companies may have a different policy for their management processes and relations with their subordinates (Lavarda & Almeida, 2013).

To infer the theoretical validity and fit of the measurement constructs, as well as in relation to the goodness-of-fit of the structural model tested and the significance of the theoretical relationships investigated in this study, we analyzed the set of indicators presented in Table 2. A summary of the results found is presented below.



## 4. PRESENTATION OF THE RESULTS

This study comprised 316 controllers, controlling managers, and controlling coordinators from different organizations. Of these, 119 are multinational firms and 197 are national ones; 54 are open capital and 262 are closed capital. The companies that compose the sample analyzed can be divided into three economic activities. Industry corresponded to 45.57% of the sample analyzed. Commerce corresponded to 18.35%. In turn, those classified as service providers cover 30.38% of the sample analyzed. With relation to the classification of these companies, as established by the National Bank for Economic and Social Development (BNDES), it was verified that all the size categories were covered in the study. There was a perceived predominance (62.66%) of companies that presented an annual turnover greater than 40 million reais.

Considering the time these companies have been operating, it was verified that 51.58% have been in

existence for 10 to 50 years, 26.90% for more than 50 years, and 21.52% for up to 10 years. With relation to the number of employees, 219 companies from the sample have up to 1,000 employees. Of the rest, 62 have up to 10 thousand employees and 35 firms have more than 10 thousand. With relation to the description of the position in the organizations in which the professionals work, “controller” is the term that covered the greatest number of respondents in the study, totaling 237 respondents. The position title “controlling coordinator” presented 40 respondents. In turn, the position of “controlling manager” had 39 respondents, which represents 12.34% of the sample analyzed.

Table 3 presents a summary of the results of the descriptive statistics analysis and the exploratory factor analysis of the theoretical construct elaborated for the study.

**Table 3**

*Descriptive statistics and exploratory factor analysis of the constructs analyzed in the study*

Var.	CA	KMO	BST	TVE%	Ind.	TI	RI	Mean	SD	AS	KT	FL	Com.
BP	0.85	0.835	865.2	60.0	BP01	1-7	1-7	6.49	1.07	-2.78	8.71	0.81	0.66
					BP02	1-7	1-7	5.75	1.43	-1.20	1.05	0.61	0.37
					BP03	1-7	1-7	6.44	0.99	-2.50	7.92	0.79	0.63
					BP04	1-7	1-7	6.10	1.24	-1.72	3.20	0.80	0.64
					BP05	1-7	1-7	6.42	0.97	-2.58	8.91	0.83	0.69
					BP06	1-7	1-7	5.97	1.31	-1.63	2.63	0.76	0.58
MP	0.88	0.893	1315	53.8	MP01	1-7	1-7	5.92	0.93	-1.04	2.03	0.70	0.49
					MP02	1-7	1-7	5.93	0.95	-1.20	3.049	0.75	0.56
					MP03	1-7	3-7	6.02	0.91	-0.68	-0.21	0.67	0.46
					MP04	1-7	2-7	5.75	1.00	-0.63	0.07	0.81	0.66
					MP05	1-7	1-7	6.08	0.97	-1.31	2.48	0.77	0.60
					MP06	1-7	1-7	5.84	1.07	-1.19	2.22	0.80	0.64
					MP07	1-7	1-7	5.61	1.17	-1.05	1.59	0.68	0.46
					MP08	1-7	1-7	5.29	1.42	-0.81	0.31	0.71	0.50
					MP09	1-7	4-7	5.89	0.74	-0.42	0.11	0.66	0.44
IS	0.84	0.71	437.2	77.3	IS01	1-7	1-7	6.09	1.13	-1.88	4.57	0.89	0.80
					IS02	1-7	1-7	6.20	1.09	-2.22	6.40	0.90	0.81
					IS03	1-7	1-7	5.69	1.37	-1.36	1.80	0.83	0.69
RA	0.81	0.826	648.1	53.5	RA01	1-7	1-7	6.37	0.91	-2.05	5.94	0.57	0.33
					RA02	1-7	1-7	5.89	1.37	-1.60	2.54	0.73	0.53
					RA03	1-7	1-7	5.33	1.50	-0.83	1.17	0.64	0.42
					RA04	1-7	1-7	6.47	0.88	-2.39	7.88	0.76	0.58
					RA05	1-7	1-7	5.85	1.31	-1.28	1.50	0.84	0.71
					RA06	1-7	1-7	5.44	1.54	-0.88	0.05	0.79	0.62

**Table 3**

Cont.

Var.	CA	KMO	BST	TVE%	Ind.	TI	RI	Mean	SD	AS	KT	FL	Com.
IA	0.95	0.892	1998.8	81.3	IA01	1-7	1-7	3.82	1.98	0.05	-1.25	0.88	0.79
					IA02	1-7	1-7	3.76	1.94	0.06	-1.20	0.91	0.83
					IA03	1-7	1-7	3.85	1.88	-0.01	-1.08	0.91	0.83
					IA04	1-7	1-7	3.49	1.88	0.20	-1.14	0.90	0.82
					IA05	1-7	1-7	3.92	1.81	-0.04	-0.94	0.88	0.78
					IA06	1-7	1-7	3.77	1.82	0.03	-1.04	0.90	0.81

CA = Cronbach's alpha; IA = information asymmetry; RA = role ambiguity; AS = asymmetry; FL = factor load; IS = vertical information sharing; Com. = commonalities; KT = kurtosis; MP = managerial performance; SD = standard deviation; Ind. = indicator; RI = real interval; TI = theoretical interval; BP = budgetary participation; BST = Bartlett's sphericity test; Var. = variable; TVE = total variance explained.

**Source:** Elaborated by the authors.

In Table 3, it is verified that the indicators of the exploratory factor analysis reached the values determined by the literature in all the constructs analyzed in the research. Thus, the relationship between the groups of variables analyzed is perceived. In addition, it is found that all the indicators of the constructs analyzed presented an appropriate factor load to keep in the constructs evaluated in the study. The results found in this stage of the research indicate minimum and maximum answers in all the constructs analyzed, which reveals minimum and maximum levels of agreement and disagreement for these questions.

These findings reveal that the budgetary configuration of the organizations the respondents work in is different, with there being companies that adopt a participative configuration and others that do not. Not all the controllers, controlling managers, and controlling coordinators perceive their influence in the budgeting processes of their organizations. Similarly, it is perceived that not all report the occurrence of vertical information sharing in their companies. The evidence found also reveals that role ambiguity is perceived in some organizations, as well as information asymmetry between some superiors and subordinates.

These findings reinforce the opportunity to carry out this study, since having found these differences it becomes possible to evaluate their effects on the theoretical relationships investigated in the study, which may indicate

how these interactions affect the influence of participation on performance. According to Shields and Shields (1998), budgetary participation influences organizational results, as well as the performance of subordinates. However, the evidence presented by Chong et al. (2005) and Zonatto (2014) reveal that this may not occur directly. Thus, there are conditioning factors of budgetary participation that explain its influence on performance at the managerial level.

As the data analyzed were obtained based on data collection, where the information on the exogenous and endogenous variables was obtained from the same source (the same respondent), the Harman test (one factor test) was carried out to verify the occurrence of common method bias, as recommended by Bido, Montovani, and Cohen (2018). The results found indicated that the constructs analyzed together generated five factors, where the first explains only 28.40% of the total variance explained, which suggests the non-existence of common method bias.

Thus, seeking to evaluate these relationships, we proceeded to analyze the results based on the SEM. Table 4 presents the results of the fit indices of the structural models tested in the study, where the first of the initial model is proposed for the investigation (Figure 1) and the second of the initial model is purified, containing only the results of the significant relationships for the sample analyzed in the study.

**Table 4***Indices of the measurement model*

Indicator	Expected value	Initial model	Purified final model
Chi-squared		925.990	595.490
DF		370	226
Chi-squared/DF	< 5	2.503	2.635
Statistical significance (p)	< 0.05	0.000	0.000
CFI	> 0.90	0.903	0.900
TLI	> 0.90	0.894	0.888
NFI	> 0.90	0.850	0.850
GFI	> 0.90	0.826	0.856
AGFI	> 0.90	0.796	0.824
RMSEA	< 0.10	0.069	0.072

AGFI = adjusted goodness-of-fit index; CFI = comparative fit index; GFI = goodness-of-fit index; DF = degree of freedom; NFI = normed fit index; RMSEA = root mean square error of approximation; TLI = Tucker-Lewis index.

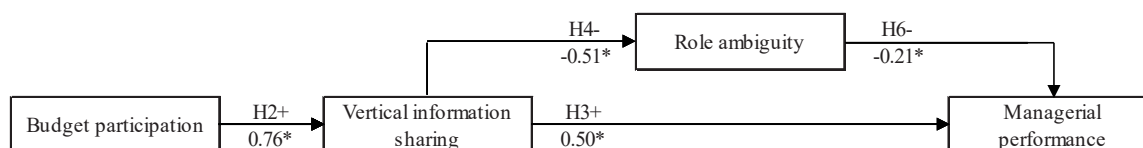
**Source:** Elaborated by the authors.

The results presented in Table 4 indicate that the initial measurement model elaborated for the analysis of the influence of the cognitive effects of vertical information sharing in the budgeting process over information asymmetry, role ambiguity, and managerial performance presented acceptable values, close to those expected, which suggests the validity of the structural measurement model. The same is observed in relation to the purified final model. The fit index of both models presented a degree of freedom (DF) of 2, significant at  $p < 0.000$ , and a root mean square error of approximation (RMSEA) of 0.075.

According to Hair, Anderson, Tatham, and Black (1992), there is no single statistical test that best describes predictions of a model. Despite there being no specific guidelines for evaluating the fit of a model, the higher the values of the Tucker-Lewis index (TLI), normed fit index (NFI), and adjusted goodness-of-fit index (AGFI), the better the general fit of the model; however, other indicators can be evaluated. When the RMSEA presents a value lower than 0.10, the analysis model is considered

acceptable. In addition, a non-significant chi-squared value is another indication of the acceptable fit of the model (Riordan & Griffeth, 1995).

In the first theoretical analysis model, it was verified that the path that evaluates the direct effects of budgetary participation on managerial performance did not present statistically significant values. The same was observed in relation to the paths that evaluate the relationships between information sharing and asymmetry and between information asymmetry and performance. Thus, in the purified model, we proceeded to analyze these relationships, initially excluding each one of these paths, so that it was possible to infer how the interactions occur between the theoretical variables that are the object of analysis in this study, which are presented in Figure 1. The results found for each one of the tests carried out confirmed the non-statistical significance of these relationships. Figure 2 reveals the final results of the path estimates of the purified measurement model used to investigate these relationships.

**Figure 2** Path estimates in the purified structural model

**Source:** Elaborated by the authors.

From the results presented in Figure 2, it is observed that budgetary participation enhances information sharing, resulting in better managerial performance. Similarly, it is perceived that in conditions of greater levels of vertical

information sharing, role ambiguity is reduced, which results in better performance. Therefore, it can be verified that information sharing constitutes a conditioning variable in the obtainment of better managerial performance.

## 5. ANALYSIS AND DISCUSSION OF THE RESULTS

The standardized coefficients and the significances of the relationships of this model are presented in Table 5.

**Table 5**

*Standardized coefficients and significances of the relationships of the models tested*

Results of the initial model								
Structural paths			Estimate	Standard error	t-value	$\rho$	Standardized coefficient	R <sup>2</sup>
IS	←	BP	0.868	0.072	12.101	*	0.761	0.579
IA	←	IS	0.153	0.109	1.404	0.160	0.086	0.007
RA	←	IS	-0.468	0.064	-7.315	*	-0.513	0.263
MP	←	IS	0.386	0.072	5.368	*	0.605	0.424
MP	←	IA	-0.034	0.018	-1.897	0.058	-0.095	0.424
MP	←	RA	-0.150	0.047	-3.198	0.001	-0.215	0.424
MP	←	BP	-0.091	0.069	-1.326	0.185	-0.125	0.424
Results of the purified final model								
IS	←	BP	0.865	0.072	12.061	*	0.756	0.571
RA	←	IS	-0.464	0.064	-7.293	*	-0.511	0.261
MP	←	IS	0.314	0.046	6.796	*	0.496	0.397
MP	←	RA	-0.147	0.047	-3.132	0.002	-0.210	0.397

IA = information asymmetry; RA = role ambiguity; IS = vertical information sharing; MP = managerial performance; BP = budgetary participation.

\* = Standard error

**Source:** Elaborated by the authors.

In Table 5, it is observed that the relationships between information sharing ← budgetary participation, role ambiguity ← information sharing, and managerial performance ← information sharing were significant at 0.01. The relationship between managerial performance ← role ambiguity was also significant, however at the 0.05 level. These results reveal that, for these cases, the t-values were higher than the values recommended by Hair et al. (2009), which indicates the existence of statistically significant relationships between the constructs, which did not occur in the other relationships investigated (information asymmetry ← information sharing and managerial performance ← information asymmetry).

It is also verified in Table 5 that the path of the measurement model that investigates the direct effects of budgetary participation on managerial performance does not reveal a significant relationship ( $\lambda = -0.125$ ) between these variables. Thus, it is not possible to affirm that the participation of individuals in the budgeting process alone

will significantly influence their job performance, thus not supporting the first research hypothesis (H<sub>1</sub>: budgetary participation is positively associated with managerial performance).

Similar results have been identified by various studies such as Brownell (1982, 1983), Kren (1992), Shields and Young (1993), Nouri and Parker (1998), Lau and Tan (1998; 2005), Lau and Lim (2002), Chong et al. (2005), Agbejule and Saarikoski (2006), and Chong and Johnson (2007). Budgetary participation motivates and helps subordinates in their job performance (Jermias & Yigit, 2012). However, its effects may not occur directly, but through other intervening variables (Dani et al., 2017; Zonatto et al., 2019). Thus, budgetary participation enables the definition of clearer goals and objectives, as well as the elaboration of better forecasts, which contributes to the organization achieving better performance; however, this situation occurs via the influence of intervening variables that act as conditioning factors, such as information sharing.



With regards to this, it is verified that budgetary participation influences vertical information sharing  $\lambda = 0.761$ , explaining 57.90% of this variable ( $R^2 0.579$ ). Thus, based on the results found, it is possible to affirm that the budgetary participation of the individuals participating in the study influences information sharing in the organizations, which confirms the second research hypothesis ( $H_2$ : budgetary participation is positively associated with vertical information sharing).

These results reveal that, in conditions of higher levels of budgetary participation, in which the individuals participating in the budgeting process perceive their influence in this process, information sharing between managers is more likely to occur, which improves the management process and tends to positively influence their performance. Therefore, participation enables subordinates to present private information to their superiors, which contributes to drawing up better budgets, making better decisions, and achieving better managerial performance (Chong et al., 2005; Chong & Johnson, 2007; Covalleski et al., 2006; Derfuss, 2016; Magner et al., 1996; Nouri & Parker, 1998; Shields & Shields, 1998; Zonatto & Lavarda, 2013).

The results of this research are corroborated by the studies from Shields and Young (1993), Shields and Shields (1998), and Parker and Kyj (2006), which demonstrated that budgetary participation has a relationship with information sharing between subordinates and superiors. Participation in the budget provides subordinates with opportunities to share their perceptions with their superiors, thus increasing the probability of subordinates communicating private information to their superiors (Covalleski et al., 2006; Parker & Kyj, 2006). However, Jermias and Setiawan (2008) highlight that superiors often do not share information with their subordinates, as they fear that they will manipulate and misinterpret the information.

Budgetary participation and vertical information sharing have presented similar results (Parker & Kyj, 2006) that indicate a positive association between these variables. According to Shields and Young (1993), budgetary participation is important for planning, control, and information sharing between subordinates and superiors, and there are reasons for the existence of budgetary participation in organizations.

However, it has to be considered that participation alone is not enough to make information sharing viable, this being determined by elements anteceding the participation of individuals in the budgeting process or present in that process that may act as facilitators or inhibitors of sharing. Thus, considering their relevance,

one research opportunity that emerges from these findings involves analyzing the conditioning factors of information sharing in the budgeting process.

Analyzing the influence of the cognitive effects of information sharing in the budgeting process, it is possible to prove or refute, using the empirical evidence found in this study, the relationships presented in the literature that have suggested some influence between the variables of the constructs analyzed. In this study, it was verified that vertical information sharing has an influence on managerial performance ( $\lambda = 0.496$ ), providing an explanatory benchmark for this relationship of  $R^2 0.397$ . Thus, it can be inferred that vertical information sharing will influence the managerial performance of these individuals, which proves the third research hypothesis ( $H_3$ : vertical information sharing is positively associated with managerial performance).

Despite this evidence suggesting that budgetary participation results in greater vertical information sharing, the findings provide indications that the effects of participation over performance do not occur directly in this measurement model. These effects are mediated by vertical information sharing, which reinforces the informative roles of the budget, a cognitive element that constitutes an important intervening variable for understanding the conditions in which greater budgetary participation results in better managerial performance.

Disclosure of private information can enable superiors to develop better strategies in relation to budgets, and information sharing can also ensure subordinates receive adequate budgeting support (Murray, 1990; Nouri & Parker, 1998), which will be reflected in managerial performance. This positive relationship shows that information sharing between superiors and subordinates facilitates employee loyalty and trust in the organization's management, thus promoting greater cooperation and flexibility at all management levels (Mia & Patiar, 2002).

Vertical information sharing also has an influence over role ambiguity ( $\lambda = -0.551$  and  $R^2 0.261$ ), which indicates that, in conditions of greater budgetary participation, there is the occurrence of greater levels of information sharing, resulting in lower levels of perceived ambiguity. Therefore, it can be affirmed that vertical information sharing is negatively related to role ambiguity, thus supporting the fourth hypothesis investigated in the research ( $H_4$ : vertical information sharing is negatively associated with role ambiguity).

The evidence found in this study suggests that vertical information sharing minimized possible negative effects of role ambiguity over managerial performance, which reinforces the informative roles of the budget. The findings

of this study coverage with the findings of Parker and Kyj (2006), who identified a negative relationship between role ambiguity and vertical information sharing. This occurs because subordinates who have clear information about their activities in the organization present low role ambiguity due to understanding the activities under their responsibility.

Disclosure of private information can enable superiors, together with their subordinates, to develop better strategies in relation to the organization's budgets (Murray, 1990). Information sharing can also ensure that subordinates receive adequate budgeting support (Nouri & Parker, 1998), which to some extent will be reflected in the performance of the managers with budgeting responsibilities.

Similarly, the opportunity to share information provides room for adjusting budget forecasts, by adapting resources and (re)defining goals and objectives to be achieved. Thus, it is possible to infer that, in these circumstances, managers with budgeting responsibilities have better conditions for achieving the desired performance, since they have an information set that allows them to define how best to proceed in order to achieve these established goals, objectives, and results.

With regards to the influence of vertical information sharing over information asymmetry, it was found that  $\lambda = 0.086$  and  $R^2 0.007$ ; thus, this relationship is not significant. This result therefore refutes the fifth hypothesis analyzed in the research ( $H_5$ : vertical information sharing is negatively associated with information asymmetry).

With relation to role ambiguity and managerial performance, it was perceived that the former has an influence over managerial performance ( $\lambda = -0.210$  and  $R^2 0.397$ ). It was verified that the cognitive effect of information sharing was reflected in the negative relationship between role ambiguity and managerial performance, which enables the sixth hypothesis elaborated for this investigation to be accepted ( $H_6$ : role ambiguity is negatively associated with managerial performance).

These results suggest that, in conditions of greater vertical information sharing, less role ambiguity occurs and, consequently, it is possible to observe better managerial performance. These findings reveal the conditioning role of information sharing in the relationship between budgetary participation and role ambiguity and between budgetary participation and managerial performance, a result that may explain the inconsistencies found in some previous studies for analyzing these relationships. Since this variable is a determinant for explaining the effects of participation, it can help in understanding

how participation will directly or indirectly influence performance. Thus, it needs to be observed and evaluated when analyzing these relationships.

According to Chenhall and Brownell (1988), this occurs when budgetary participation provides enough information that can be capable of reducing the role ambiguity of subordinates, which, to some extent, will contribute to improving the managerial performance of the subordinates (Kren, 1992). Dunk (1993) and Zonatto et al. (2019) revealed the negative relationship between the role ambiguity and managerial performance of subordinates. Palomino and Frezatti (2016) demonstrate that Brazilian controllers perceive role conflict and ambiguity, but nonetheless present moderate levels of satisfaction. In this case, even with the perception of information asymmetry or role ambiguity, information sharing may be capable of positively influencing the job performance of these managers, minimizing to negative effects of these variables.

With relation to the influence of information asymmetry over managerial performance, no significant relationship was identified between these variables at the 5% level, thus refuting the seventh research hypothesis ( $H_7$ : information asymmetry is negatively associated with managerial performance). However, the results found are significant at a p-value of 0.10 ( $p > 0.07$ ), and the relationship is negative between these variables analyzed in the study. Thus, it is possible to infer that individuals with better performance reported lower levels of information asymmetry in their organizations.

Studies such as Baiman and Evans (1983) and Zonatto and Lavarda (2013) have suggested that budgetary participation enables subordinates to have access to information that is relevant for carrying out their tasks, which would reduce information asymmetry and positively influence their job performance. Information sharing between superiors and subordinates facilitates employee loyalty and trust in the organization's management, promoting more cooperation and flexibility at all management levels (Mia & Patiar, 2002). Consequently, in these conditions, it is possible to reduce information asymmetry between superiors and subordinates and its negative effects on performance.

In summary, based on the analysis of the influence of the factors investigated in this research, it can be inferred that budgetary participation would positively influence the managerial performance of individuals in the budgetary context, but indirectly, mediated by the intervening effects of information sharing. These findings demonstrate that the greater the participation of individuals in the budgets of the organizations they work in, the greater

the vertical information sharing tends to be, resulting in better managerial performance and in lower levels of role ambiguity and information asymmetry.

The findings of this study revealed that most of the managers participating in the research are strongly involved with the elaboration of the budget, have influence, and actively make contributions in their unit's budgeting process, receiving and providing information. In these conditions, these professionals are able to present high managerial performance in the organizations they work in. This occurs because, based on this participation, better adjustments of the objectives and assumptions for allocating resources become possible, which improves the budget forecasts made, providing the organizations with more realistic and adequate forecasts. For Magner et al. (1996), it is subordinates with responsibilities that have privileged information about their business units. Thus, as they have intimate knowledge of their own work, they are better able to estimate the workload, the demand for resources, as well as the conditions needed to achieve the objectives determined by the organization.

Despite this evidence, the results found also revealed that the budgetary configuration of the organizations in which these professional work is distinct, which results in distinct effects on their performance. It was verified

that there are managers who participate ceremonially in the budgeting processes, and do not have a significant influence over these processes. Similarly, as identified in other studies, the Brazilian controllers also reported the existence of role ambiguity (Palomino & Frezatti, 2016), as well as information asymmetry (Lavarda & Almeida, 2013), in their organizations. In these cases, based on the descriptive analysis of the data, it was possible to identify that these results are also associated with lower levels of information sharing and worse managerial performance.

In general, the analyses carried out in this research demonstrate that information sharing constitutes a determinant variable in order to be able to observe the cognitive effects of budgetary participation on performance. The findings of this study indicate that, in Brazil, the greater the participation of individuals in the budgeting processes of organizations, the greater the vertical information sharing between superiors and subordinates and the greater their managerial performance tend to be.

Finally, in a new regression model, we sought to evaluate whether the characterization variables are capable of explaining the results found in this research. Table 6 presents a summary of the results found for this analysis.

**Table 6**

*Results of the additional analysis*

Variables		BP	IS	RA	IA	MP	
Independent variables	Control (national/multinational)	Coefficients	0.026	0.189*	0.029	-0.001	0.039
	Capital (open/closed)		-0.134*	-0.001	-0.135*	-0.082	-0.003
	Industry		0.098	0.149*	0.029	-0.075	0.082
	Size (turnover)		-0.013	-0.036	-0.099	0.023	-0.025
	N° of employees		0.034	-0.028	0.109	0.172*	0.007
	Time the company has existed		-0.002	-0.014	0.044	-0.050	-0.069
R²		0.024	0.045	0.024	0.027	0.010	
Sig. Anova		0.285	0.025	0.281	0.211	0.791	

IA = information asymmetry; RA = role ambiguity; IS = vertical information sharing; MP = managerial performance; BP = budgetary participation.

\* Significant at the 5% level.

Source: Elaborated by the authors.

It can be observed in Table 6 that the managers of closed-capital companies are less likely to participate in the budgeting process. The diversity of a company may affect the behavior of the subordinates with regards to their participation in the budgeting process (Merchant, 1984). Sitkin (1996) revealed that open-capital companies seek constant growth of short-term

results, which directly leads to more controls and greater involvement of subordinates in organizational processes, unlike closed-capital companies, in which subordinates do not have a high incentive to participate in the budgeting process.

In addition, it is verified that individuals in closed-capital companies with budgeting responsibilities tend to



have less role ambiguity. Damodaran (2002) demonstrated that owners of closed-capital companies concentrate most of their wealth in their own businesses and are concerned about the total risk of the activity. Thus, managers of closed-capital companies tend to guide their subordinates so that they know their real decision-making authority, thus reducing the role ambiguity of individuals in the organization.

Nationally controlled and industrial organization companies are variables that are positively related with vertical information sharing between superiors and subordinates. With regards to the budget, Parker (1978) explains that this is the means through which management can communicate with other people in the company. The findings of Harrison (1992) demonstrate that individuals' participation in organizational processes in national companies is greater due to their knowledge of the national culture, which leads to greater information sharing, and that subordinates have different

reactions to communication in companies from different nations.

The results of the study demonstrated that controllers, controlling managers, and controlling coordinators of companies with a greater number of employees are more prone to information asymmetry. To operate effectively, organizations adapt their structure and their processes according to the size of the organization (Covaleski et al. 2006). As Merchant (1984) explains, as the number of employees grows, there is growth in the number of activity channels that require greater information flows, which will be reflected in greater information asymmetry.

In general, the results found based on the additional analysis with control variables reveal that variables involving characteristics of the companies the respondents form part of differentiate the effects found in the relationships tested in the study. Thus, it is verified that the profile of the sample may have been reflected in the results revealed in the research.

## 6. CONCLUDING REMARKS

This study analyzed the cognitive effects of vertical information sharing in the budgeting process on the relationship between budgetary participation and managerial performance. The cognitive effects evaluated in the research relate to the informative roles of the budget and their impacts on information asymmetry, on role ambiguity, and on performance. The descriptive study was carried out by collecting data and employing a qualitative approach to analyze the data, using SEM. The sample included 316 respondents who carry out the role of controller, controlling manager, or controlling coordinator.

The results found show that the direct relationship between budgetary participation and performance is not statistically significant in the model tested. Budgetary participation positively influences vertical information sharing, which presented a positive and statistically significant influence over the managerial performance of the managers who participated in the research. Vertical information sharing results from cognitive effects of budgetary participation.

Greater levels of vertical information sharing are reflected in less role ambiguity and in better managerial performance. Even among individuals with budgeting responsibilities, when the existence of information asymmetry is perceived in the work environment, the effects over performance are not significant, which is a reflection of the cognitive effects of participation.

The evidence found enables it to be concluded that the organization's budgetary configuration influences the way information sharing will occur and will consequently produce cognitive effects on managerial performance. Organizations that adopt a participative budgetary configuration are more likely to promote vertical information sharing, reduce the effects of role ambiguity, and improve managerial performance.

These results reveal conditioning effects of the levels of information sharing among these relationships (participation and performance), determining their consequent impacts, which are reflections of this sharing, on information asymmetry, on role ambiguity, and on managerial performance. These results contribute to understanding the mediating cognitive effects of information sharing on the relationship between participation and performance, revealing that the effects of participation on performance may not occur based on a simple causality relationship, but rather based on certain conditioning factors. This evidence presents important implications for the field of studies, since it reveals conditions in which participation results in better performance, contributing to the understanding of the interactions between the variables investigated in this study.

By comparatively analyzing the results found in this study for the models that evaluate the direct and indirect effects of budgetary participation over the managerial



performance of managers of companies that operate in Brazil, it can be inferred that, based on the analysis of the indirect effects (mediating cognitive effects of information sharing), it is possible to better understand the interactions in the budgetary context that determine the influence of participation on the job performance of individuals.

Even though the results cannot be generalized, this evidence encourages new studies to be carried out, by providing indications of variables that influence the actions of a specific group of managers in the budgetary context, in this case controllers, on whom there is still little evidence of behavioral variables that influence the relationship between budgetary participation and their

job performance. The need to observe the effects of other variables that may influence these relationships reveals the opportunity to carry out new studies based on a broader theoretical perspective.

Elements anteceding participation that are present in budgeting processes may help in understanding an organization's budgetary configuration and its consequent effects on the attitudes, behaviors, and performance of these professionals. Cognitive elements related to the individuals, such as their personality and psychological capacities, may contribute to understanding their actions. The reflections of these actions result in attitudes and behaviors that generate effects on their performance.

## REFERENCES

- Agbejule, A., & Saarikoski, L. (2006). The effect of cost management knowledge on the relationship between budgetary participation and managerial performance. *The British Accounting Review*, 38(4), 427-440.
- Anthony, R. N., & Govindarajan, V. (2008). *Sistemas de controle gerencial* (12<sup>th</sup> ed.). São Paulo, SP: McGraw-Hill.
- Baiman, S., & Evans, J. H. (1983). Pre-decision information and participative management control systems. *Journal of Accounting Research*, 21(2), 371-395.
- Baiman, S., & Lewis, B. L. (1989). An experiment testing the behavioral equivalence of strategically equivalent employment contracts. *Journal of Accounting Research*, 27(1), 1-20.
- Baldvinsdottir, G., Mitchell, F., & Nørreklit, H. (2010). Issues in the relationship between theory and practice in management accounting. *Management Accounting Research*, 21(2), 79-82.
- Beuren, I. M., Roth, T. C., & Anzilago, M. (2017). Efeitos da aplicação do princípio da controlabilidade no desempenho gerencial mediada pelo conflito e ambiguidade de papéis. *Revista Universo Contábil*, 13(3), 6.
- Bido, D., Mantovani, D. M. N., & Cohen, E. D. (2018). Destruição de escalas de mensuração por meio da análise fatorial exploratória nas pesquisas da área de produção e operações. *Gestão & Produção*, 25(2), 384-397.
- Brownell, P. (1981). Participation in budgeting, locus of control and organizational effectiveness. *Accounting Review*, 56(4), 844-860.
- Brownell, P. (1982). The role of accounting data in performance evaluation, budgetary participation, and organizational effectiveness. *Journal of Accounting Research*, 20(1), 12-27.
- Brownell, P. (1983). Leadership style, budgetary participation and managerial behavior. *Accounting, Organizations and Society*, 8(4), 307-321.
- Chen, Q. (2003). Cooperation in the budgeting process. *Journal of Accounting Research*, 41(5), 775-796.
- Chenhall, R. H., & Brownell, P. (1988). The effect of participative budgeting on job satisfaction and performance: Role ambiguity as an intervening variable. *Accounting, Organizations and Society*, 13(3), 225-233.
- Chong, V. K., & Johnson, D. M. (2007). Testing a model of the antecedents and consequences of budgetary participation on job performance. *Accounting and Business Research*, 37(1), 3-19.
- Chong, V. K., Eggleton, I. R., & Leong, M. K. (2005). The impact of market competition and budgetary participation on performance and job satisfaction: A research note. *The British Accounting Review*, 37(1), 115-133.
- Clarkson, G., Jacobsen, T. E., & Batcheller, A. L. (2007). Information asymmetry and information sharing. *Government Information Quarterly*, 24(4), 827-839.
- Covaleski, M., Evans III, J. H., Luft, J., & Shields, M. D. (2006). Budgeting research: Three theoretical perspectives and criteria for selective integration. *Handbooks of Management Accounting Research*, 15(1), 587-624.
- Creswell, J. W., & Clark, V. L. P. (2007). *Designing and conducting mixed methods research*. Thousand Oaks (CA), Sage.
- Damodaran, A. (2002). *A face oculta da avaliação*. São Paulo, SP: Saraiva. (Translation: Allan Vidigal Hastings).
- Dani, A. C., Zonatto, V. C. S., & Diehl, C. A. (2017). Participação orçamentária e desempenho gerencial: Uma meta-análise das relações encontradas em pesquisas desenvolvidas na área comportamental da contabilidade. *Advances in Scientific & Applied Accounting*, 10(1), 54-72.
- Derfuss, K. (2016). Reconsidering the participative budgeting-performance relation: A meta-analysis regarding the impact of level of analysis, sample selection, measurement, and industry influences. *The British Accounting Review*, 48(1), 17-37.
- Dunk, A. S. (1989). Budget emphasis, budgetary participation and managerial performance: A note. *Accounting, Organizations and Society*, 14(4), 321-324.
- Dunk, A. S. (1993). The effect of budget emphasis and information asymmetry on the relation between budgetary participation and slack. *Accounting review*, 68(2), 400-410.
- Ferris, K. R. (1977). A test of the expectancy theory of motivation in an accounting environment. *Accounting review*, 52(3), 605-615.
- Govindarajan, V., & Anthony, R. N. (2001). *Sistemas de controle gerencial*. São Paulo, SP: Atlas.

- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2009). *Análise multivariada de dados*. Porto Alegre, RS: Bookman.
- Hair, J. R., Jr., Anderson, R. E., Tatham, R. L., & Black, W. C. (1992). *Multivariate data analysis*. New York, NY: Macmillan.
- Hopwood, A. G. (1976). *Accounting and human behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Jackson, S., & Schuler, R. (1985). A meta-analysis and conceptual critique of research on role ambiguity and role conflict in work settings. *Organizational Behavior and Human Decision Processes*, 36, 16-78.
- Jermias, J., & Setiawan, T. (2008). The moderating effects of hierarchy and control systems on the relationship between budgetary participation and performance. *The International Journal of Accounting*, 43(3), 268-292.
- Jermias, J., & Yigit, F. (2012). Budgetary participation in Turkey: The effects of information asymmetry, goal commitment, and role ambiguity on job satisfaction and performance. *Journal of International Accounting Research*, 12(1), 29-54.
- Jöreskog, K. G., & Sörbom, D. (1989). *SPSS LISREL 7 and PRELIS. User's guide and reference*. Bloomington, IN: SPSS.
- Karakoc, E. Y., & Özer, G. (2016). An investigation of budget-related antecedents of job performance. *International Journal of Research in Business and Social Science* (2147-4478), 5(3), 38-53.
- Kim, B. P., Murrmann, S. K., & Lee, G. (2009). Moderating effects of gender and organizational level between role stress and job satisfaction among hotel employees. *International Journal of Hospitality Management*, 28(4), 612-619.
- Kren, L. (1992). Budgetary participation and managerial performance: The impact of information and environmental volatility. *Accounting Review*, 67(3), 511-526.
- Kyj, L., & Parker, R. J. (2008). Antecedents of budget participation: Leadership style, information asymmetry, and evaluative use of budget. *Abacus*, 44(4), 423-442.
- Lau, C. M., & Lim, E. W. (2002). The effects of procedural justice and evaluative styles on the relationship between budgetary participation and performance. *Advances in Accounting*, 19(2002), 139-160.
- Lau, C. M., & Tan, J. J. (1998). The impact of budget emphasis, participation and task difficulty on managerial performance: a cross-cultural study of the financial services sector. *Management Accounting Research*, 9(2), 163-183.
- Lau, C. M., & Tan, S. L. (2005). The importance of procedural fairness in budgeting. *Advances in Accounting*, 21, 333-356.
- Lavarda, C. E. F. & Almeida, D. M. (2013). Participação orçamentária e assimetria informacional: Um estudo em uma empresa multinacional. *BBR-Brazilian Business Review*, 10(2), 74-96.
- ltural generalizability of the relation between participation, budget emphasis and job related attitudes. *Accounting, Organizations and Society*, 17(1), 1-15.
- Magner, N., Welker, R. B., & Campbell, T. L. (1996). Testing a model of cognitive budgetary participation processes in a latent variable structural equations framework. *Accounting and Business Research*, 27(1), 41-50.
- Marginson, D., & Ogden, S. (2005). Coping with ambiguity through the budget: The positive effects of budgetary targets on managers' budgeting behaviours. *Accounting, Organizations and Society*, 30(5), 435-456.
- Merchant, K. A. (1984). Influences on departmental budgeting: An empirical examination of a contingency model. *Accounting, organizations and society*, 9(3-4), 291-307.
- Mia, L. (1988). Managerial attitude, motivation and the effectiveness of budget participation. *Accounting, Organizations and Society*, 13(5), 465-475.
- Mia, L., & Patiar, A. (2002). The interactive effect of superior-subordinate relationship and budget participation on managerial performance in the hotel industry: An exploratory study. *Journal of Hospitality & Tourism Research*, 26(3), 235-257.
- Milani, K. (1975). The relationship of participation in budget-setting to industrial supervisor performance and attitudes: A field study. *The Accounting Review*, 50(2), 274-284.
- Murray, D. 1990. The performance effects of participative budgeting: An integration of intervening and moderating variables. *Behavioral Research in Accounting*: 104-123.
- Nouri, H., & Parker, R. J. (1998). The relationship between budget participation and job performance: The roles of budget adequacy and organizational commitment. *Accounting, Organizations and society*, 23(5-6), 467-483.
- Oro, I. M., Beuren, I. M., & da Silva Carpes, A. M. (2014). Competências e habilidades exigidas do controller e a proposição para sua formação acadêmica. *Contabilidade Vista & Revista*, 24(1), 15-36.
- Palomino, M. N., & Frezatti, F. (2016). Role conflict, role ambiguity and job satisfaction: Perceptions of the Brazilian controllers. *Revista de Administração*, 51(2), 165-181.
- Parker, L. D. (1978). Communication in the corporate budgetary system. *Accounting and Business Research*, 8(31), 191-207.
- Parker, R. J., & Kyj, L. (2006). Vertical information sharing in the budgeting process. *Accounting, Organizations and Society*, 31(1), 27-45.
- Riordan, C. M., & Griffeth, R. W. (1995). The opportunity for friendship in the workplace: An underexplored construct. *Journal of Business and Psychology*, 10(2), 141-154.
- Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970). Role conflict and ambiguity in complex organizations. *Administrative Science Quarterly*, 15(2), 150-163.
- Santos, E. A., Anzilago, M., & Lunkes, R. J. (2017). Sistemas de mensuração de desempenho, clareza de papel, *empowerment* psicológico e desempenho gerencial: Um estudo de suas relações. *Revista Universo Contábil*, 13(3), 143.
- Shields, J. F., & Shields, M. D. (1998). Antecedents of participative budgeting. *Accounting, Organizations and Society*, 23(1), 49-76.
- Shields, M. D., & Young, S. M. (1993). Antecedents and consequences of participative budgeting: Evidence on the effects of asymmetrical information. *Journal of Management Accounting Research*, 5, 265-280.
- Siegel, G., & Kulesza, C. S. (1996). The coming changes in management accounting education. *Strategic Finance*, 77(7), 43.
- Silva, A. F. S., & Gomes, J. S. (2011). Consideração do elemento cultural no desenho de sistemas de controle de gestão das empresas estrangeiras: Estudo de casos. *Contabilidade Vista & Revista*, 22(1), 143-176.

- Sitkin, S. B. (1996). Learning through failure: The strategy of small losses. In M. Cohen, & U. Sproull (Eds.), *Organizational learning* (pp. 541-577). Thousand Oaks, CA: Sage.
- Zonatto, V. C. S., & Lavarda, C. E. F. (2013). Evidências dos efeitos da participação orçamentária na assimetria de informação, estresse ocupacional e desempenho no trabalho. *Advances in Scientific and Applied Accounting*, 6(1), 92-111.
- Zonatto, V. C. S., Weber, A., & Nascimento, J. C. (2019). Efeitos da participação orçamentária na assimetria informacional, estresse ocupacional e desempenho gerencial. *Revista de Administração Contemporânea*, 2(1), 67-91.
- Zonatto, V. D. S. (2014). *Influência de fatores sociais cognitivos de capacidade, vontade e oportunidade sobre o desempenho gerencial nas atividades orçamentárias das maiores empresas exportadoras do Brasil* (Doctoral Thesis). Universidade Regional de Blumenau, Blumenau. Retrieved from [http://www.bc.furb.br/docs/TE/2014/358328\\_1\\_1.pdf](http://www.bc.furb.br/docs/TE/2014/358328_1_1.pdf).
- Zoni, L., & Kenneth, M. (2007). Controller involvement in management: an empirical study in large Italian corporations. *Journal of Accounting & Organizational Change*, 3(1), 29-43.